57

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/730,671	12/08/2003	Steven Jeffrey Goldberg	I-2-0505.1US	4786

24374 7590 08/16/2005

VOLPE AND KOENIG, P.C.
DEPT. ICC
UNITED PLAZA, SUITE 1600
30 SOUTH 17TH STREET
PHILADELPHIA, PA 19103

EXAMINER	
MEHRPOUR, NAGHMEH	
ART UNIT	**PAPER NUMBER**
2686	

DATE MAILED: 08/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/730,671	GOLDBERG ET AL.
	Examiner	Art Unit
	Naghmeh Mehrpour	2686

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *18 April 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-4, 6-8, 16, 18-29, 31-32, are rejected under 35 U.S.C. 102(e) as being anticipated by Etkin (US publication 2004/0204108).

Regarding claim 1, Etkin teaches a method for coordinating the use of beam forming between two communicating entities (see figure 1, page 4 section 0046) wherein control information regarding the use of beam forming is not communicated between the two entities (see figure 1, page 4 section 0047), the method comprising the steps of:

selecting one of the two communicating entities for reduction of the amount in which the selected entity will adjust its beam in response to misalignment between beams emanating from the two entities (see figure 1, page 4 section 0047);

measuring an error in the alignment of the beams emanating from the two communicating entities (as the base station transmits signal (beam-formed) (page 5 sections 0047, 0049);

selecting at least one adjustment parameter for adjusting the beam of the selected entity (page 2 section 0021); and

adjusting the beam of the selected entity using the selected adjustment parameter, **whereby the beams emanating from the two communication entities are aligned respect to each other** (see figure 4, page 4 sections 0044, 0047).

Regarding claim 2, Etkin teaches a method of claim 1 wherein the two communicating entities are a base station and a WTRU (see figure 1, page 4 section 0046).

Regarding claim 3, Etkin teaches a method of claim 1 wherein the two communicating entities are two WTRUs (see figure 1, page 4 section 0046).

Regarding claim 4, Etkin teaches a method of claim 1 (see rejection for claim 1), further comprising the step of:

repeating the measuring and adjusting steps until the error measured is below a predetermined value (page 2 section 0015, page 3 section 0022).

Regarding claim 16, Etkin teaches a method for coordinating the use of beam forming between two communicating entities (page 4 section 0046) wherein control information regarding the use of beam forming is not communicated between the two entities (page 4 section 0047), the method comprising the steps of:

selecting one of the two communicating entities for reduction of its beam adjustment (base station using the array antenna) (page 4 section 0047);

measuring an error in the alignment of beams emanating from the two communicating entities (page 2 section 0021); and

the selected communicating entity refraining from adjusting beam and the other communicating entity adjusting **its beam in accordance with the measured error of the selected entity** (page 4 sections 0044, 0047).

Regarding claim 18, Etkin teaches a method for coordinating the use of beam forming between two communicating entities (page 4 section 0046) wherein control information regarding the use of beam forming is communicated between the two entities (page 4 section 0047), the method comprising the steps of:

selecting a correction factor for each of the entities (page 5 section 0049);

each entity measuring an error in the alignment of beams emanating from the two communicating entities (page 5 section 0049); and

adjusting the beam of both entities according to their respective correction factors and error measurement, **whereby the beams emanating from the two communication entities are aligned respect to each other** (page 4 sections 0044, and 0047, 0049).

Regarding claim 19, Etkin teaches a method of claim 18 wherein the two communicating entities are a base station and a WTRU (see figure 1, page 4 section 0046).

Regarding claim 20, Etkin teaches a method of claim 18 wherein the two communicating entities are two WTRUs (see figure 1, page 4 section 0046).

Regarding claim 25, Etkin teaches a wireless communication system wherein beams may be adjusted to enhance wireless communications between wireless entities operating in the system (page 4 section 0047), the wireless communication system comprising:

a plurality of wireless entities (page 4 section 0046), said entities being capable of communicating using beam formed transmission and reception patterns and including a processor for measuring an error in the alignment of their own beam and the beam of another entity with which they are communicating (the processor of any one of the wireless entities are configured to adjust the beam, therefore the beam adjustment is inherently in the proper amount as related to the error measurement)(page 4 section 0044 and 0047)page 6 section 0061); and

wherein at least one of two communicating wireless entities adjusts its beam a fraction of the error measured in the alignment of its beam with respect to the beam of the other wireless entity (page 4 sections 0044, and 0047).

Regarding claim 26, Etkin teaches a wireless communication system of claim 25 wherein the processor of the at least one communicating wireless entity is configured to adjust the beam of the at least one wireless entity in an amount equal to the fraction multiplied by the error measured (page 6 section 0062, and referring to claim 25, the beam adjustment is inherently in the proper amount as related to the error measurement) (page 2 section 0014, page 4 sections 0044, and 0047).

Regarding claim 27, Etkin teaches a wireless communication system of claim 26 wherein a first of the two communicating wireless entities includes a transmitter configured to transmit the fraction to a second of the two communicating wireless entities (page 5 section 0049).

Regarding claim 28, Etkin teaches a wireless communication system of claim 27 wherein the second wireless entity includes a receiver configured to receive the fraction and further includes a processor to adjust the beam of the second wireless entity in an amount equal to one minus the fraction multiplied by the error measured (page 2 section 0014, page 4 sections 0044, and 0047). The adjustment is inherently in the proper amount as related to the error measurement)

Regarding claim 29, Etkin teaches a wireless communication system of claim 28 wherein the first wireless entity is a WTRU and the second wireless entity is a WTRU (see figure 1, page 4 section 0046).

Regarding claim 30, Etkin teaches a wireless communication system of claim 28 wherein the first wireless entity is a WTRU and the second wireless entity is a base station (page 4 section 0046)

Regarding claim 31, Etkin teaches the wireless transmit/receive unit (WTRU) configured to maintain alignment of its beam with the beam of another wireless entity with which the WTRU is communicating (see figure 1, page 4 section 0046), the WTRU comprising:

a first processor (inherently included within the mobiles known in the art) configured to measure an error in the alignment of a first beam emanating from the WTRU and a second beam emanating from the other wireless entity (the base station transmits signals each of the mobile station receives the signals and computes a SINR page 6 section 0059); and

a second processor (page 6 section 0062) configured to compute a first fraction and adjust the first beam in an amount equal to the first fraction multiplied by the error measured (page 4 sections 0044 and 0049).

Regarding claim 32, Etkin teaches a WTRU of claim 31 further comprising:

a transmitter configured to transmit the fraction of the measured error that the WTRU will adjust its beam to the wireless entity with which the WTRU is communicating (page 5 section 0049).

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. **Claim 5,** is rejected under 35 U.S.C. 103(a) as being unpatentable over Etkin (US publication 2004/0204108).

Regarding claim 5, Etkin fails to teach a method of claim 1 wherein the fraction is 0.5. However the Examiner takes official notice that a method of error beam adjustment wherein using fraction of 0.5, is well known in the art. Therefore, it would have been obvious to ordinary skill in the art at the time the invention is made to combine the above teaching with Etkin, in order to need to reduce the effects of propagation attenuation of a signal transmitted and an antenna system.

3. **Claims 6-8, 21-23,** are rejected under 35 U.S.C. 103(a) as being unpatentable over Etkin (US publication 2004/0204108) in view of Benjauthrit (US Patent 6,225,961 B1).

Regarding claim 6, Etkin fails to teach a method of claim 1 wherein the error measurement and beam adjustment is performed in the azimuth dimension. However,

Benjauthrit teaches a method of claim 1 wherein the error measurement and beam adjustment is performed in the azimuth dimension (col 10 lines 1-5, col 16 lines 38-65). Therefore, it would have been obvious to ordinary skill in the art at the time the invention is made to combine the above teaching of Benjauthrit with Etkin, in order to need to reduce the effects of propagation attenuation of a transmitted signal of an antenna system.

Regarding claim 7, Etkin fails teach a method of claim 1 wherein the error measurement and beam adjustment is performed in the elevation dimension. However, Benjauthrit teaches a method of claim 1 wherein the error measurement and beam adjustment is performed in the azimuth dimension (col 10 lines 1-5, col 16 lines 38-65). Therefore, it would have been obvious to ordinary skill in the art at the time the invention is made to combine the above teaching of Benjauthrit with Etkin, in order to need to reduce the effects of propagation attenuation transmitted signal and an antenna system (col 10 lines 1-5, col 16 lines 38-65). Therefore, it would have been obvious to ordinary skill in the art at the time the invention is made to combine the above teaching of Benjauthrit with Etkin, in order to need to reduce the effects of propagation attenuation of a signal transmitted and an antenna system.

Regarding claim 8, Etkin fails teach a method of claim 1 wherein the error measurement and beam adjustment is performed in the azimuth and elevation dimensions. Benjauthrit teaches a method of claim 1 wherein the error measurement

and beam adjustment is performed in the azimuth and elevation dimensions (col 10 lines 1-5, col 16 lines 38-65). Therefore, it would have been obvious to ordinary skill in the art at the time the invention is made to combine the above teaching of Benjauthrit with Etkin, in order to need to reduce the effects of propagation attenuation of transmitted signal and an antenna system.

Regarding claim 21, Etkin fails to teach a method of claim 18 wherein the error measurement and beam adjustment is performed in the azimuth dimension. However, Benjauthrit teaches a method of claim 1 wherein the error measurement and beam adjustment is performed in the azimuth dimension (col 10 lines 1-5, col 16 lines 38-65). Therefore, it would have been obvious to ordinary skill in the art at the time the invention is made to combine the above teaching of Benjauthrit with Etkin, in order to need to reduce the effects of propagation attenuation of a transmitted signal of an antenna system.

Regarding claim 22, Etkin fails teach a method of claim 18 wherein the error measurement and beam adjustment is performed in the elevation dimension. However, Benjauthrit teaches a method of claim 1 wherein the error measurement and beam adjustment is performed in the azimuth dimension (col 10 lines 1-5, col 16 lines 38-65). Therefore, it would have been obvious to ordinary skill in the art at the time the invention is made to combine the above teaching of Benjauthrit with Etkin, in order to need to reduce the effects of propagation attenuation transmitted signal and an

antenna system (col 10 lines 1-5, col 16 lines 38-65). Therefore, it would have been obvious to ordinary skill in the art at the time the invention is made to combine the above teaching of Benjauthrit with Etkin, in order to need to reduce the effects of propagation attenuation of a signal transmitted and an antenna system.

Regarding claim 23, Etkin fails teach a method of claim 18, wherein the error measurement and beam adjustment is performed in the azimuth and elevation dimensions. Benjauthrit teaches a method of claim 1 wherein the error measurement and beam adjustment is performed in the azimuth and elevation dimensions (col 10 lines 1-5, col 16 lines 38-65). Therefore, it would have been obvious to ordinary skill in the art at the time the invention is made to combine the above teaching of Benjauthrit with Etkin, in order to need to reduce the effects of propagation attenuation of transmitted signal and an antenna system.

3. **Claims 9-15, 24, 33-35,** are rejected under 35 U.S.C. 103(a) as being unpatentable over Etkin (US publication 2004/0204108) in view of Raleigh et al. (US Patent 6,225,961 B1).

Regarding claim 9, Etkin teaches a method for coordinating the use of beam forming between two communicating entities wherein control information regarding the use of beam forming is communicated between the two entities (see figure 1, page 4 section 0046), the method comprising the steps of:

measuring an error in the alignment of beams emanating from the two communicating entities(see figure 2, page 5 section 0049);

communicating the correction measurement between the entities; and

adjusting the beam of both entities according to their respective correction factors (refer to claim 6). Etkin fails to teach a method wherein selecting a correction factor for each of the entities wherein the sum of the two correction factors is equal to one. However Raleigh teaches a method wherein selecting a correction factor for each of a two entities wherein the sum of the two correction factors is equal to one (page 8 sections 0096, 0099). Therefore, it would have been obvious to ordinary skill in the art at the time the invention is made to combine the above teaching of Raleigh with Etkin, in order to need to reduce the effects of propagation attenuation of transmitted signal and an antenna system.

Regarding claim 10, Etkin teaches a method of claim 9 wherein the two communicating entities are a base station and a WTRU (see figure 1, page 4 section 0046).

Regarding claim 11, Etkin teaches a method of claim 9 wherein the two communicating entities are two WTRUs (see figure 1, page 4 section 0046).

Regarding claims 12, Etkin modified by Raleigh fails to teach a method of claim 9 wherein the error measurement and beam adjustment is performed in the azimuth dimension. However, Benjauthrit teaches a method of claim 9 wherein the error

measurement and beam adjustment is performed in the azimuth dimension (col 10 lines 1-5, col 16 lines 38-65). Therefore, it would have been obvious to ordinary skill in the art at the time the invention is made to combine the above teaching of Benjauthrit with Etkin modified by Raleigh, in order to form an antenna signals having maximum gain by angularly displacing the transmit beam from the optical axis.

Regarding claim 13, Etkin modified by Raleigh fails to teach a method of claim 9 wherein the error measurement and beam adjustment is performed in the elevation dimension. However, Benjauthrit teaches a method of claim 9 wherein the error measurement and beam adjustment is performed in the elevation dimension (col 10 lines 1-5, col 16 lines 38-65). Therefore, it would have been obvious to ordinary skill in the art at the time the invention is made to combine the above teaching of Benjauthrit with Etkin modified by Raleigh, in order to form an antenna signals having maximum gain by angularly displacing the transmit beam from the optical axis.

Regarding claims 14, Etkin modified by Raleigh fails to teach a method of claim 9 wherein the error measurement and beam adjustment is performed in the azimuth and elevation dimensions. However, Benjauthrit teaches a method of claim 9 wherein the error measurement and beam adjustment is performed in the azimuth and elevation dimensions (col 10 lines 1-5, col 16 lines 38-65). Therefore, it would have been obvious to ordinary skill in the art at the time the invention is made to combine the above teaching of Benjauthrit with Etkin modified by Raleigh, in order to form an

antenna signals having maximum gain by angularly displacing the transmit beam from the optical axis.

Regarding claim 15, Etkin modified by Raleigh teaches a method of claim 9 wherein the correction factor of one entity is zero thereby causing said entity to refrain from adjusting its beam (page 7 section 0072). One skill in art would immediately conceptualize that the beam-forming turning off is the result of an error measurement being insignificant.

Although Etkin disclose a method as described above, Etkin fails specifically to disclose a method wherein the correction factor of one entity is zero thereby causing the entity to refrain from adjusting its beam. However, Raleigh disclose a method where matching correction allows receive channel a statistics collected for each of the frequency channel to be accurately used within the corresponding transmit channel (col 21 lines 32-48). Therefore, it would have been obvious to ordinary skill in the art at the time the invention is made to combine the teaching of Etkin, as described, with the teaching of Raleigh to arrive at a method as described in the claimed invention. A motivation to do so would have been to arrive at an accurate adaptive transmit beam forming based on the result of an adaptive receive beam forming as related to the error measurement.

Regarding claim 24, Etkin teaches a method of claim 18 wherein the correction factor of one entity is zero thereby causing said entity to refrain from adjusting its beam (page

7 section 0072). One skill in art would immediately conceptualize that the beam-forming turning off is the result of an error measurement being insignificant.

Although Etkin disclose a method as described above, Etkin fails specifically to disclose a method wherein the correction factor of one entity is zero thereby causing the entity to refrain from adjusting its beam. However, Raleigh disclose a method where matching correction allows receive channel a statistics collected for each of the frequency channel to be accurately used within the corresponding transmit channel (col 21 lines 32-48). Therefore, it would have been obvious to ordinary skill in the art at the time the invention is made to combine the teaching of Etkin, as described, with the teaching of Raleigh to arrive at a method as described in the claimed invention. A motivation to do so would have been to arrive at an accurate adaptive transmit beam forming based on the result of an adaptive receive beam forming as related to the error measurement.

Regarding claim 33, Etkin teaches a WTRU of claim 32 further comprising:

a receiver configured to receive, from the wireless entity with which the WTRU is communicating, a second fraction with which the entity used to adjusts its beam (base station transmits signal, each of the mobile station receives the signal and computes a signal to noise ration SINR (page 3 section 0022, page 5 section 0049).

Although Etkin disclose a WTRU, Etkin fails to specifically mention when a second fraction is received, the second processor being configured to compute the first fraction by subtracting one minus the second fraction and adjusting the first beam in an amount

equal to the first fraction multiplied by the error measured. However Raleigh teaches receives and transmit antenna array are designed to provide identical radiation characteristic when operated at receive and transmit frequencies, respectively. However, Raleigh discloses receive and transmit antenna arrays are designed to provide identical radiation characteristics when operated at receive and transmit frequencies, respectively. Accordingly, in many instances the physical geometries of transmit and receive antenna Arrays are simply physically scaled to account for the fractional difference in the receive and transmit RF wavelengths (col 5 lines 30-36). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to combine both teaching to arrive at the claimed invention. A motivation to do so would have been to arrive at an accurate adaptive transmit beam forming based on the result of an adaptive receive beam forming as related to the error measurement.

Regarding claim 34, Etkin teaches the WTRU of claim 33 wherein the wireless entity with which the WTRU is communicating is another WTRU (see figure 1, page 4 section 0046).

Regarding claim 35, Etkin teaches the WTRU of claim 33 wherein the wireless entity with which the WTRU is communicating is a base station (see figure 1, page 4 section 0046).

4. **Claim 17,** is rejected under 35 U.S.C. 103(a) as being unpatentable over Benjauthrit (US Patent 6,225,961 B1) in view of Raleigh et al. (US Patent 6,225,961 B1).

Regarding claim17, Benjauthrit teaches a method for coordinating the use of beam forming between two communicating entities (col 6 lines 49-65) wherein control information regarding the use of beam forming is communicated between the two entities (col 7 lines 2-11), the method comprising the steps of:

selecting a first correction factor for each of the entities for use in the azimuth dimension (col 16 lines 28-62);

selecting a second correction factor for each of the entities for use in the elevation dimension (col 16 lines 28-62); and

measuring an error in the alignment of beams emanating from the two communicating entities in the azimuth dimension (col 10 lines 1-5, col 12 lines 29-48);

measuring an error in the alignment of beams emanating from the two communicating entities in the elevation dimension (col 10 lines 1-5, lines 43-54, col 16 lines 28-);

adjusting the beam of both entities according to their respective first correction factors wherein an error is detected in the azimuth dimension (col 10 lines 1-5, col 16 lines 29-65); and

adjusting the beam of both entities according to their respective second correction factors wherein an error is detected in the elevation dimension (col 16 lines 28-62).

Benjauthrit fails to teach a method wherein selecting a correction factor for each of the entities wherein the sum of the two correction factors is equal to one. However Raleigh teaches a method wherein selecting a correction factor for each of a two entities wherein the sum of the two correction factors is equal to one (page 8 sections 0096, 0099). Therefore, it would have been obvious to ordinary skill in the art at the time the invention is made to combine the above teaching of Raleigh with Benjauthrit, in order to need to reduce the effects of propagation attenuation of transmitted signal and an antenna system.

Conclusion

5. Applicant's arguments filed 4/18/05 have been fully considered but they are not persuasive.

In response to the applicant's argument that *Etkin is not elated to a measurement of an error in alignment degree of misalignment of two beams from two communication entities, but just an effect of beam sweeping by the base station.*

The Examiner asserts that Etkin teaches Base station 12 is configured to perform time-varying beam forming operations through the use of one or more antenna arrays in conjunction with an FPM scheme or a similar scheme. "Beam forming" is used herein to refer to the forming of a directional antenna gain pattern for the forward link of a base station. In one embodiment, an antenna array consisting of two antenna elements is utilized. Each antenna

element itself has a fixed, possibly directional, but relatively broad gain pattern. A first one of these antennas transmits a signal with a constant amplitude gain and phase, while the other of the antennas transmits the same signal, but at a possibly lower amplitude gain and with a time-varying phase shift relative to the first antenna. The two signals interfere with each other, constructively in some regions and destructively in others, resulting in a modified time-varying antenna gain pattern, which is possibly narrower and more directional than either of the two individual antenna gain patterns (page 4 section 0047).

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. **Any responses to this action should be mailed to:**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Naghmeh Mehrpour whose telephone number is 571-272-7913. The examiner can normally be reached on 8:00- 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha Banks-Harold be reached (571) 272-7905.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

NM

August 10, 2005

MELODY MEHRPOUR
PATENT EXAMINER